Multinomial Processing Tree (MPT) Modeling: MPT Modeling with multiTree

Daniel W. Heck

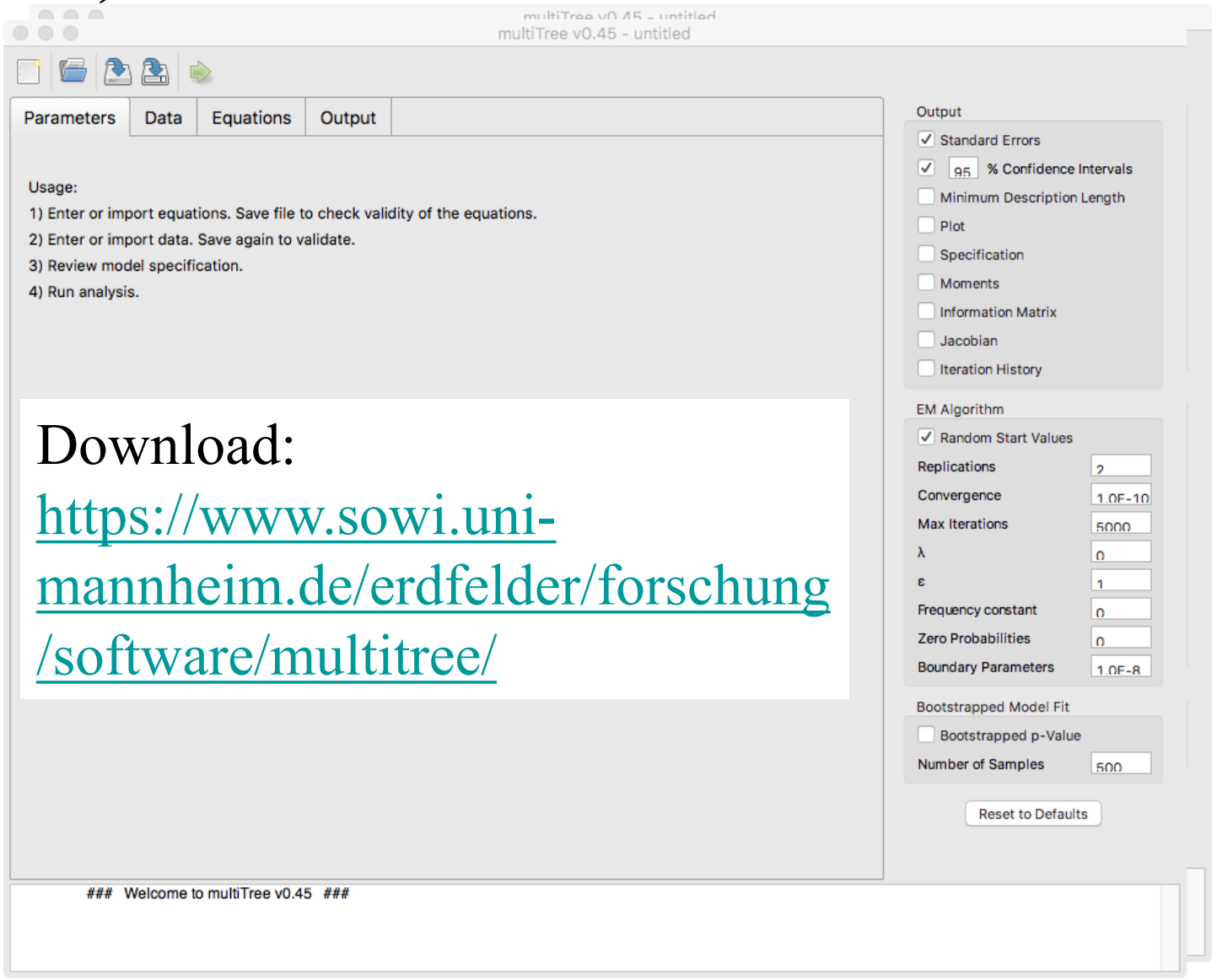
Philipps-Universität Marburg

(slides adapted from Edgar Erdfelder)

2) Applications

- 2.1) Model definition
- 2.2) Identifiability checks
- 2.3) Practical exercises

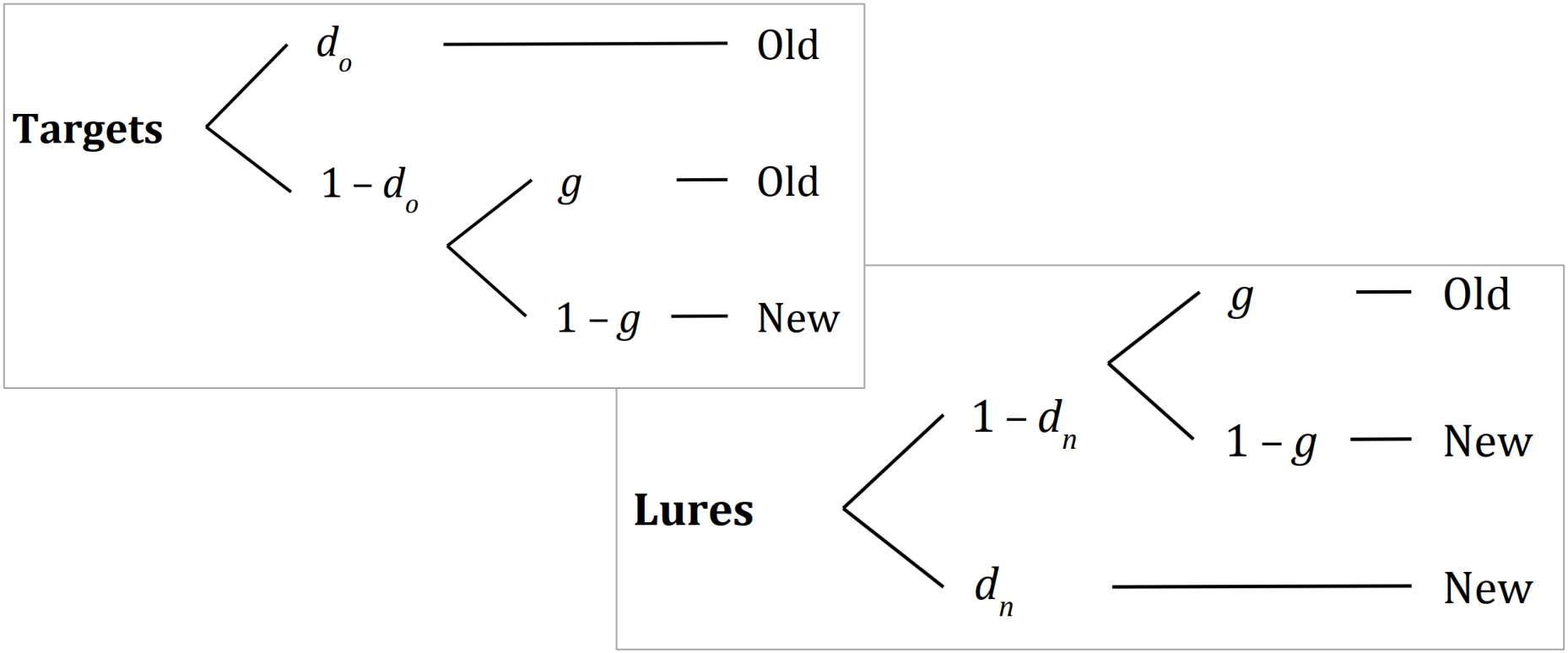
2) Introduction to multiTree



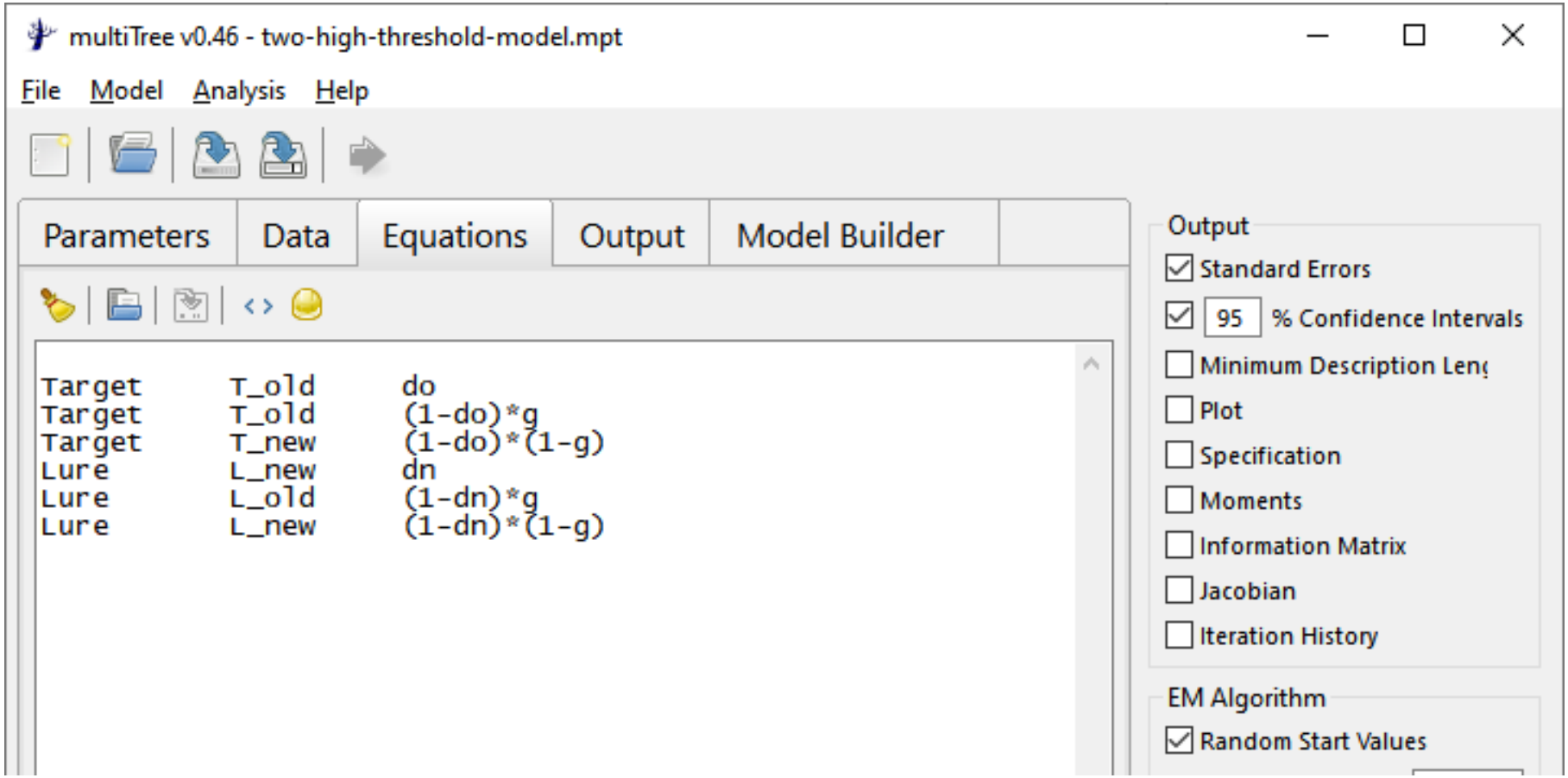
Download:
https://www.sowi.uni-mannheim.de/erdfelder/forschung/software/multitree/

2.1) Application: Define Model

1.) Open multiTree and provide the model equations of the Two-High-Threshold Model:



Two-High-Threshold Model (2HTM)

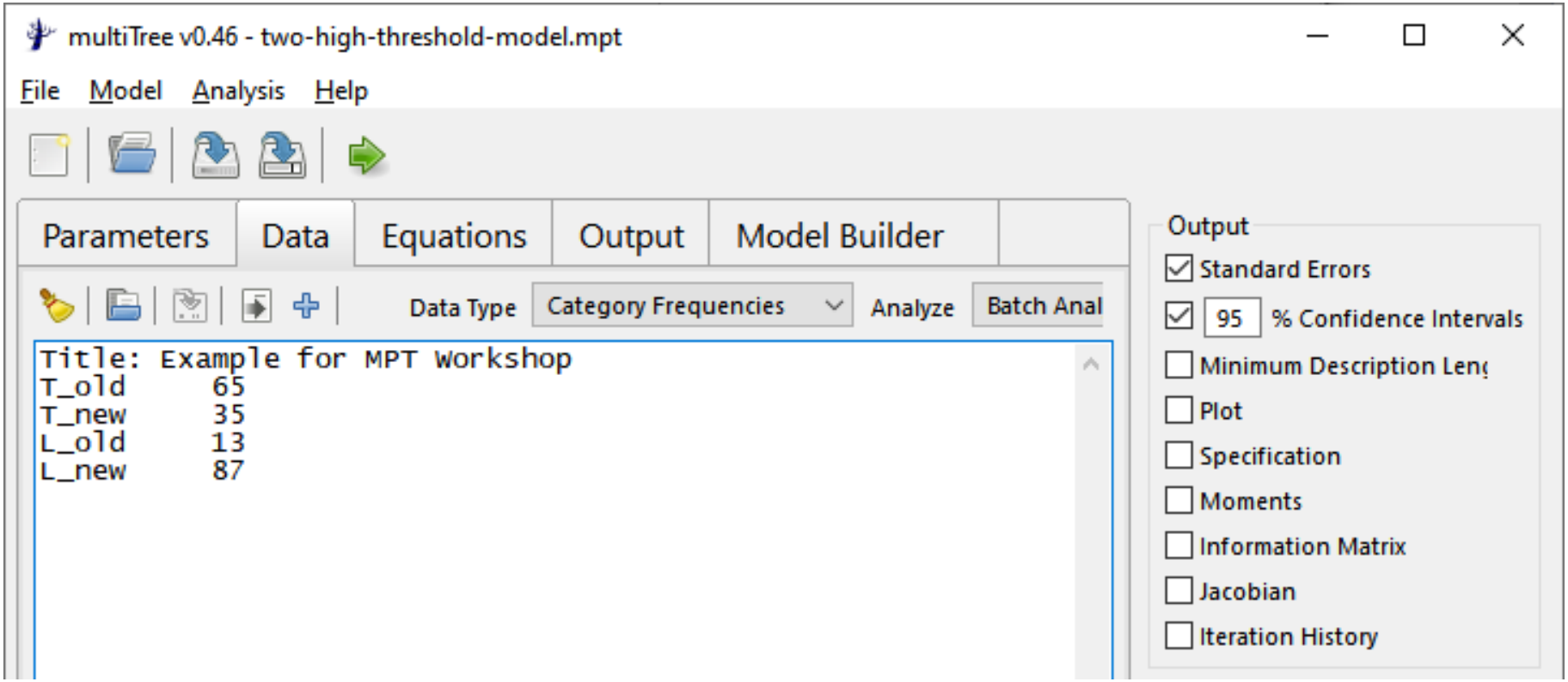


Application: Provide Data

2.) Provide the following observed frequencies:

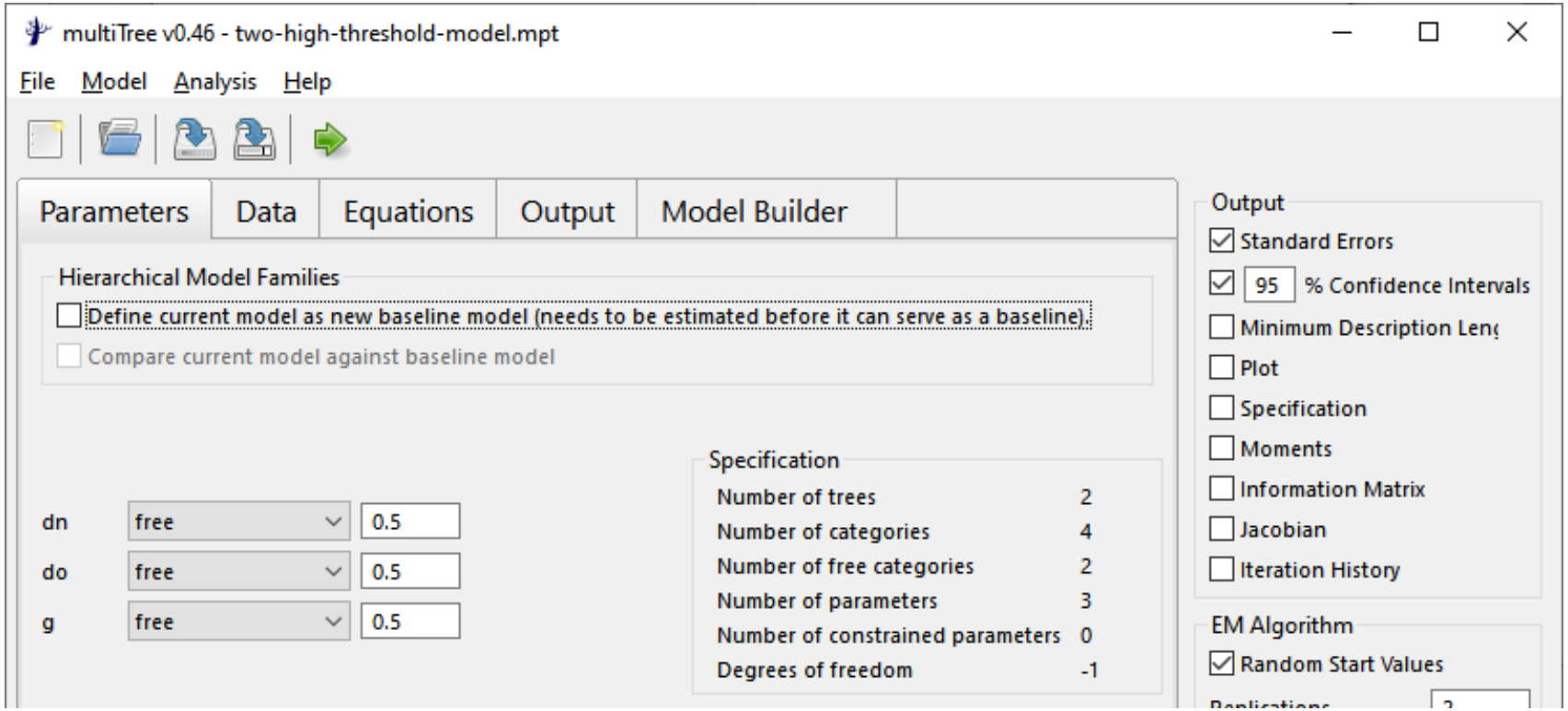
	„old“	„new“
Target	65	35
Lure	13	87

Data


multiTree v0.46 - two-high-threshold-model.mpt
File
Model
Analysis
Help
Parameters
Data
Equations
Output
Model Builder
Data Type
Category Frequencies
Analyze
Batch Anal
Title: Example for MPT Workshop
T_old 65
T_new 35
L_old 13
L_new 87
Output
Standard Errors
95
% Confidence Intervals
Minimum Description Leng
Plot
Specification
Moments
Information Matrix
Jacobian
Iteration History

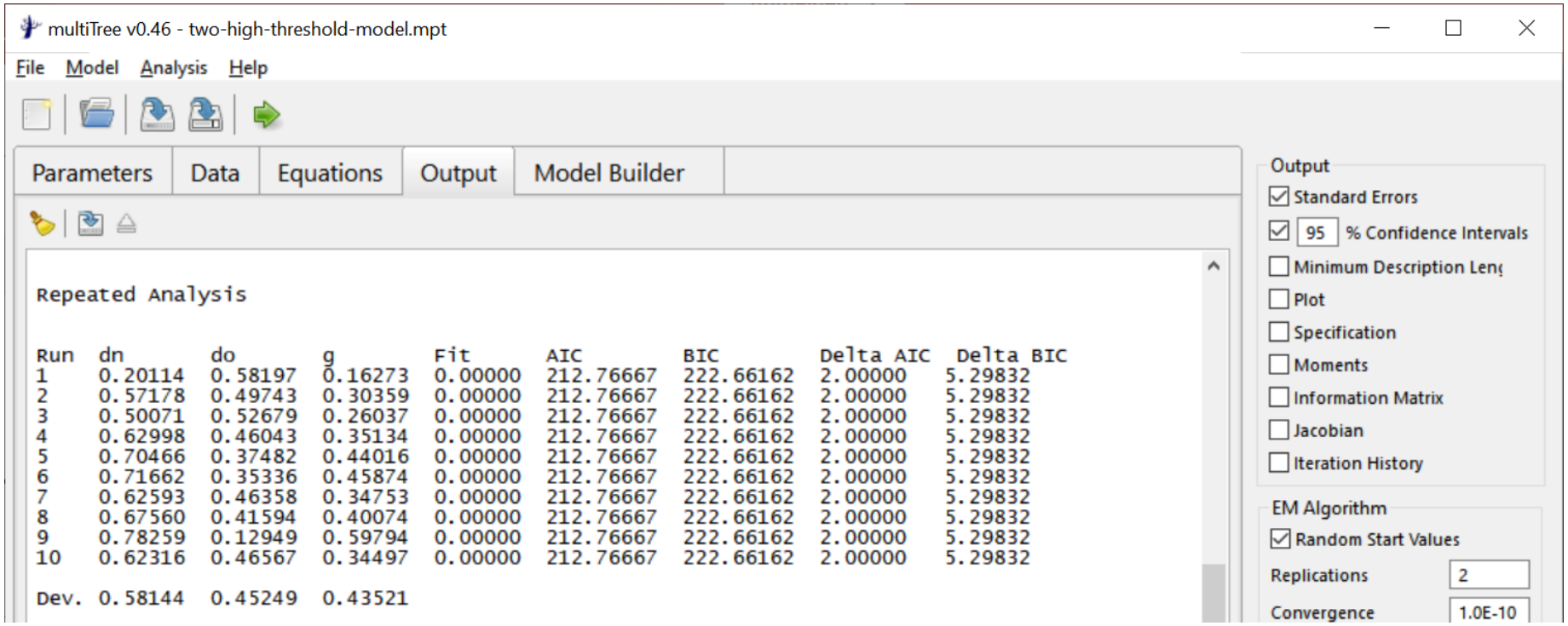
Application: Model Definition

3.) Is the model identifiable?



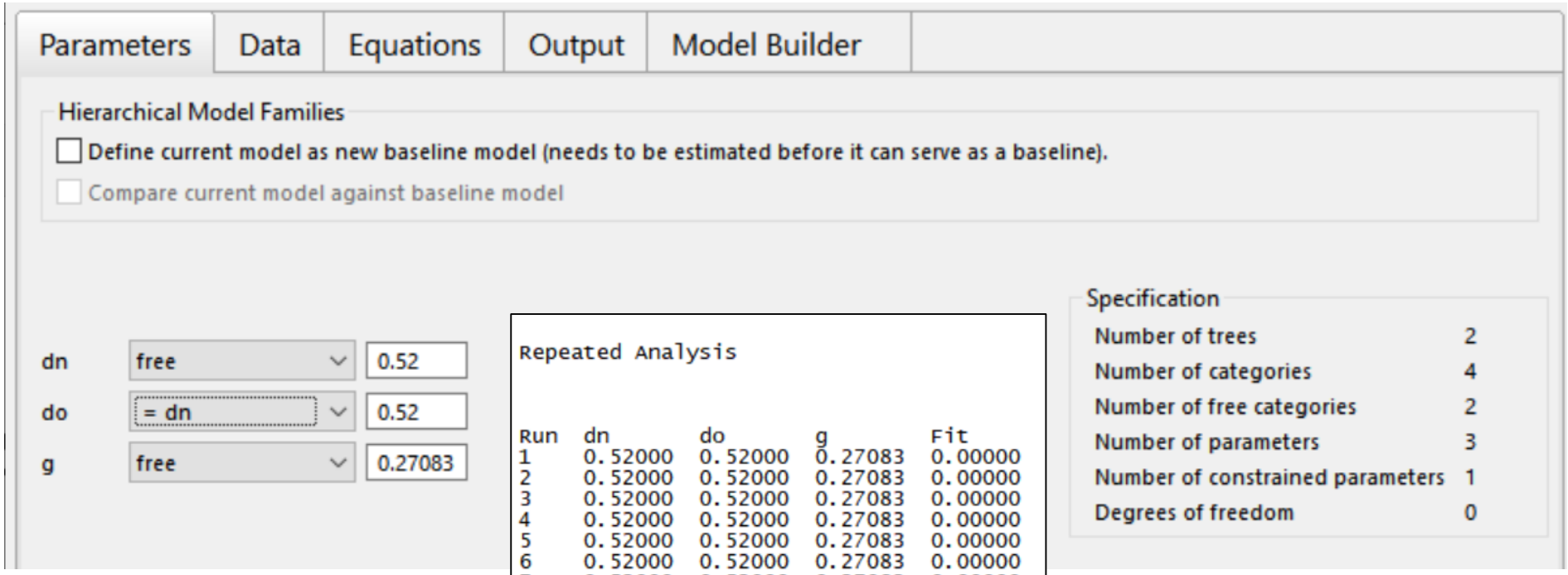
2.2) Application: Identifiability

4.) Check identifiability via repeated analysis



2.2) Application: Identifiability

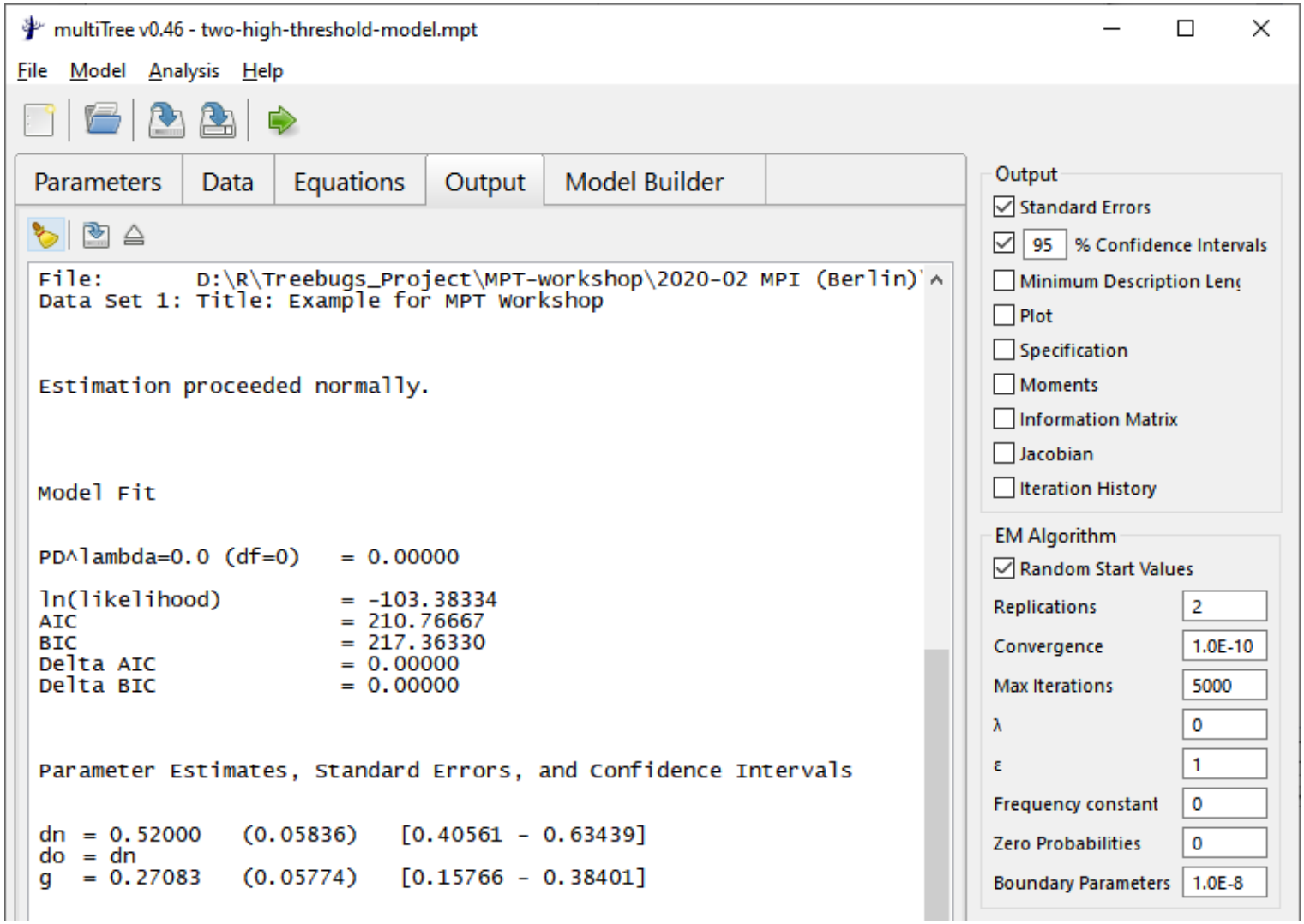
5.) Obtaining an identifiable model:



2.2) Identifiability Checks in multiTree

- Repeated analysis
  - Check stability of parameters estimates for a specific vector of observed frequencies
- Simulated identifiability
  - Check recovery of simulated parameters:
  - Repeated data generation for random parameter vectors θ in Ω followed by estimation
- Get Jacobian
  a) Check rank of the Jacobian for a random parameter θ
  b) Use specific parameter values θ from parameter tab

Model Fitting: Output



2.3) Practical Exercises

1. Extend the 2HTM to two base rate conditions:

		„old“	„new“
30% Targets	Target	65	35
	Lure	13	87
70% Targets	Target	83	17
	Lure	43	57

2. Estimate the model for both conditions jointly.
3. Does *g* differ significantly between conditions?